Factors Associated with Remission and Relapse in Patients Treated for Alcohol Dependence Syndrome

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Introduction

A substance is defined as “any psychoactive compound with the potential to cause health and social problems, including addiction. These substances may be legal (e.g., alcohol and tobacco); illegal (e.g., heroin and cocaine); or controlled for use by licensed prescribers for medical purposes such as hydrocodone or oxycodone for example Oxycontin, Vicodin, and Lortab” (Rehm et al., 2013).

Among the substances, the primary focus of clinical research has been mostly on alcohol (Murthy et al., 2010). Data, as surveyed by these authors, show that there are around 14.6% of people (which is around 16 crore people of the country) between the age group of 10 and 75 years who drink alcohol. Comparatively alcohol consumption is more in men (27.3%) than women (1.6%). Therefore, for every woman, there are about 17 men who drink alcohol. Among those who drink alcohol, either country made (‘Desi Sharab’) or spirits of foreign origin but made in India are highly (about 30%) preferred for consumption. State-wise, those with higher rates of alcohol consumption are as follows: Chhattisgarh, Tripura, Punjab, Arunachal Pradesh and Goa. It is estimated that nearly one in five who qualify for a dependent pattern of alcohol consumption requires immediate intervention as compared to other drug users. Therefore, the relative use, as well as the relative number of people in the disorder category for alcohol are substantially high which warrants attention to this population (Ambekar et al., 2019).

Diagnosis of Alcohol Dependence Syndrome (as per ICD-10)

The international classificatory system of mental disorders, ICD-10 needs a minimum of three among the diagnostic guidelines amid the others for about a month in order to be diagnosed as having alcohol dependence syndrome. The criteria listed are overt and covert behaviours related to the craving, inability to keep a check on the amount of drinking behaviour, presence of withdrawal syndrome, increased quantity of alcohol than previously

consumed smaller amounts to obtain the original effects of the drug, preferring to drink alcohol most often over other essential works, using alcohol despite being aware of its hazardous costs on self and others (World Health Organization, 1992).

Relapse

Earlier studies and researchers have attempted to describe the meaning and definition of relapse as multifaceted, complex and erratic (Donovan, 1996; Marlatt, 1996; Buhringer, 2000). Some authors projected this concept utilising a rather self-report measure involving subjective explanation without any stringent norm that accounts for either the intensity or quantity of alcohol or drug consumed. So, the description of alcohol relapse was construed upon individuals' report of the active use of the psychoactive substance signifying a repeated pattern (Fisher et al., 1998). Relapse also refers to the manifestation of a clinically recognizable set of signs and symptoms that connotes multiple uses or abuse of the drug post-treatment and discharge, requiring another admission into the rehabilitation facility (Kneisl & Trigoboff, 2013).

Models of Relapse

There are several models of relapse prevention that view relapse in myriad ways. The most comprehensive model of relapse prevention which has been widely accepted in the scientific community is the cognitive-behavioural relapse prevention model proposed by Marlatt (Witkiewitz & Marlatt, 2004). The other models such as medical model (McLellan et al., 2000), stress model (Marlatt 1996; Brady & Sonne, 1999; Malhotra et al., 1999; Stewart, 2000), model of craving (Rohsenow & Monti, 1999; Tiffany & Conklin, 2000), model of social learning theory (Rohsenow & Monti, 1999), model of cognitive processing theory (Tiffany & Conklin, 2000), model of coping (Marlatt, 1996), model of attribution theory (Seneviratne & Saunders, 2000), model of co-morbidity and personality (Allsop et al., 2000; Strowig, 2000; McKay et al., 2001; Hasin et al., 2002; Miller, 2002; Compton III et al., 2003;

Roozen, 2003; Ross et al., 2003; Angres et al., 2004) and a few other models of compulsive behaviour, length of use and onset, family history, sexual abuse and living style (Labouvie et al., 1997; Froehlich et al., 2000; Cooney et al., 2003; De et al., 2003; Callaghan, 2003; Nathan, 2003; Hodgins & el-Guebaly, 2004; Burgdorf et al., 2004; Dawson et al., 2005; Walitzer & Dearing, 2006) considers relapse as a setback of the treatment while Marlatt's relapse prevention model observed that relapse is not a setback of the treatments provided. Also, the model challenged the earlier view of the concept of relapse as a final outcome of the treatment.

Marlatt's Relapse Prevention Model (Historical Foundations and Overview)

This theory is of the view that relapse is a condition or process which changes in its condition before and after the return to a particular expected behaviour (Larimer et al., 1999; Witkiewitz & Marlatt, 2004). Also, traditional models affirmed that relapse had two different end results, which was later projected as fluctuations and not different outcomes.

An important presumption of Marlatt's RP model was the existence of certain highly pre-disposing events or circumstances that leads to relapse and the time interval is very close between such instances and relapse. These situations increase the susceptibility and proclivity of the individual to get into the condition that was under observation or study.

According to this RP model, logically preceding factors to relapse included abstinence violation effect (AVE), self-efficacy (Bandura, 1997), ways to overcome or cope with behavioural changes, situations fraught with risk of relapse and also nurturing thoughts of the occurrence of unfavourable events (Goldman et al., 1999). The process of starting a change in the behaviour is different from sustaining of such changes of behaviour and both had separate and uncommon circumstances (Brownell et al., 1986; Rothman, 2000) according to the RP model.

The RP model advocated using universally used techniques like work-life balance, changes in lifestyle, which were directly responsible situations prior to relapse. Adopting a life pattern that would result in minimal stress, indulging in beneficial works, and achieving something satisfactory would help in minimizing the risks of relapse. Thus, the RP model exhibits superiority in its approach to several methods of treatment and traditional theories and research, by focussing on several factors of cognition, behaviour and treating every individual and every method of treatment in a different way, in stark contrast to traditional approach where commonality was the assumption.

Prevention of Relapse (Development of Research in the Decade: 2000-2010)

Relapse Prevention, Second Edition (Marlatt & Witkiewitz, 2005) and its companion text, Assessment of Addictive Behaviors, Second Edition (Donovan & Marlatt, 2005), Reformulation of Marlatt's Cognitive-Behavioral Relapse Model were some of the landmarks in the research development related to relapse prevention in the above period of ten years. The dynamic nature of the relapse process (Witkiewitz & Marlatt, 2004) had supplanted traditional linear models with more focus on factors that were characteristically complex, unstable and non-linear factors that had individual or combined effects and consideration of various high-risk situations for relapse. Prevention of relapse entailed concentrated efforts to develop, test and refine the existing models and their assumptions (Orleans, 2000; Maisto & Connors, 2006; Brandon et al., 2007). The authors linked the distal risk factors and proximal risk factors with tonic and phasic responses. The tonic factors were considered to be stable factors (family history, genetic vulnerability, drug-affinity of the individual, withdrawal symptoms, etc.) and the phasic factors (abstinence self-efficacy, cravings, mood, temporary expectations of results of the substance) were considered to be temporary factors with regard to the condition of relapse (Hufford et al., 2003; Witkiewitz & Marlatt, 2004). With dynamism at its core, the modern research focussed on the combined effect of tonic and

phasic aspects with complexity a necessary aspect of such a cumulative process. Though the revisited RP model was based on cognitive-behaviour principles, ideas were borrowed also from 'Non-Linear Dynamical Systems Theory' (NDST) and 'Catastrophe Theory' as the underlying system was complex in nature (Witkiewitz & Marlatt, 2007a; Witkiewitz & Marlatt, 2007b). Research (Guastello, 2016) offers three characteristics by which a complex system can be identified:

1. Absence of a particular order in the system and the same not being mentioned in the beginning itself.
2. Changes were impossible after the system was fully designed.
3. Many a times, the configurations for the future could not be derived based on the present configurations.

The salient factors, as per this revised RP model, each identified individually as playing an essential role as well as having empirical research backing in alcohol relapse or remission were abstinence self-efficacy (Gwaltney et al., 2009; Herd & Borland, 2009; Herd et al., 2009), alcohol outcome expectancy (McCarthy & Thompsen, 2006; Wiers et al., 2007; Stacy & Wiers, 2010; Field et al., 2010; Schoenmakers et al., 2010), alcohol withdrawal (Piasecki et al., 2000; Baker et al., 2004; Baker et al., 2006), negative affect (Shiffman & Waters, 2004 Piasecki, 2006; Witkiewitz & Villarroel, 2009), coping (Litt et al., 2005; O'Connell et al., 2007; Muraven, 2010) and mindfulness (Fernandez et al., 2010; Keng et al., 2011; Garland, 2011; Murphy & MacKillop, 2012; Bowen et al., 2012). Hence these variables were chosen for the present study.

Research Questions

- Unlike the earlier models which take only one or two variables to understand relapse, can the reformulated relapse prevention model, which comprehensively

considers several important key-risk factors together be utilised to understand alcohol relapse and remission?

- Can we identify the role of the key risk factors both distal and proximal in the process of alcohol relapse and remission over time?
- Among the key-risk factors, are there some specific factors that contribute to alcohol relapse or non-relapse for those in the non-residential treatment setting?
- Among the key-risk factors, are there some specific factors that contribute to alcohol remission for those in the residential treatment setting?

Review of Literature

Family History of Substance Use and Alcohol Relapse

Having someone in the family with a concern related to alcohol abuse is a recognized feature in envisaging the initial onset of the ingesting of alcohol and its related disorders (Chand et al., 2013; Nair et al., 2016) although it is best predicted when a positive family history is combined with other phenotypes (Kinreich et al., 2021). The same holds good for alcohol relapse according to many studies (Grichting & Barber, 1989; Mattoo et al., 2009; Sharma et al., 2012; Sureshkumar et al., 2017; Chauhan et al., 2018) wherein relapse is more likely if individuals have a family history positive for alcohol use disorder and additionally a few other factors as well along with it in order to predict alcohol relapse with more confidence. For instance, in one of the studies by Rentala et al. (2020) the likelihood of relapse was not only based on just the positive family history alone but also similar proportions of several previous attempts for giving up on alcohol. Similarly, remission in alcohol use disorder is best predicted through the use of genetic data supporting the role of family history coupled with several other behavioural markers than prediction models based on single domain alone as asserted in a research by Kinreich et al. (2021). This emphasizes the inclusion of observable behaviour characteristics in accurately predicting remission in

alcohol use disorder or its relapse even when biological markers are studied to test the accuracy of such predictions highlighting the role of psychosocial factors in this process of alcohol relapse or in maintaining remission (Kinreich et al., 2021).

Alcohol Abstinence Self-Efficacy and Alcohol Relapse

Alcohol abstinence self-efficacy means the perceived ability of the individual to remain sober from alcohol use/abuse (Young et al., 2005). The concept of self-efficacy has been studied far and wide in the history of relapse and remission of alcohol and time and again proven its importance in preventing a relapse or in maintaining remission (Bandura, 1986; Blomqvist, 1999; Mattoo et al., 2009; Inbaraj et al., 2019). Higher levels of self-efficacy incline towards better ability to cope with high-risk situations that push an individual into relapse and in-turn aid in maintaining abstinence (Dawson et al., 2007). In a study conducted in the city of California on 15 participants from an in-patient treatment programme for substance use disorder, the results provided quite a contrary finding with regard to the relationship between self-efficacy and relapse. Authors argued that self-efficacy did not always have to be a predictor of abstinence after a year's time following d.ischarge from the residential treatment program (Ilgen et al., 2005). Another study published a year later by the same authors extended the same findings and asserted that self-efficacy had the power to predict maximum number of days into abstinence when coupled with strong therapeutic alliance during the treatment (Ilgen et al., 2006).

Alcohol Outcome Expectancy and Alcohol Relapse

The theory of expectancy says that the pre-existing expectancies about consumption of alcohol may determine or influence an individual's behaviour in actuality as compared to the physiological effects of the same substance (Connors et al., 1986). Theory of expectancy has been well-studied in the field of alcohol use and proven with considerable efficacy that it indeed influences the behaviour of an individual significantly (Lang et al., 1975; Schwarz et

al., 1978; Hull & Bond, 1986; Sobell & Sobell, 2016). Positive outcome expectancy was significantly lower in the post-treatment individuals who completed a 12-week CBT programme for "alcohol use disorder as compared to pre-treatment while the negative alcohol outcome expectancy was significantly higher in the same group following treatment" (Coates et al., 2018).

Increased risk of use of alcohol post-treatment is predicted with higher scores in positive alcohol outcome expectancy in a study that was conducted on Canadian students in grade 7 to 11 to test the predictive validity of a new, brief, self-report tool on outcome expectancy and their subjective values on alcohol and marijuana (Fulton et al., 2012). A hospital-based correlational study on psychosocial factors associated with alcohol relapse among 110 participants having alcohol use disorder, in Vietnam, revealed that alcohol positive outcome expectancy was correlated in a positive direction with relapse in addition to certain other variables used in the study. In the same study, there was a negative correlation found between coping, perception of one's ability to reach a goal, and the number of people extending support in their social circle and relapse. However, negative outcome expectancies and positive emotional states were not significantly related to relapse (Van Trieu et al., 2020). Davis and Clifford (2016) endorsed that positive alcohol outcome expectancies significantly predicted relapse risk although with a limitation of fewer subjects in the study to ascertain its validity.

Mindfulness and Alcohol Relapse

Mindfulness means being in a state of awareness to the present moment without labelling anything or having a non-judgemental attitude (Segal et al., 2002). Customary intervention for alcohol relapse is centred around the theoretical fact that combination of some factors within the individual and the situations in the outside world such as peer pressure or the easy availability coupled with failure to inhibit the urge to consume a substance as a consequence

of this combination itself can pave way for relapse (Witkiewitz & Marlatt, 2004). Numerous recent studies highlight the efficacy of mindfulness in hindering the process of relapse to substance abuse related disorders including alcohol (Brewer et al., 2009; Zgierska et al., 2009) and therefore there is a rapid increase in the interest in intervention programmes based on mindfulness (Lau & Segal, 2007). A multinomial logistic regression analysis found that being aware of one's actions and no reactions were the two facets that predicted substance use disorders (Fernandez et al., 2010). On the contrary, two other studies revealed that, component of observation and rise in use of substance had no bearing on each other (Leigh et al., 2005; Leigh & Neighbors 2009). Such high observational mind could have favourable (good) or unfavourable (bad) effects depending on the degree of other facets present at that time (Eisenlohr-Moul et al., 2012). Further studies have also pointed out that even though there are inconsistencies in the findings related to the facets, it is important to explore and study the facets in-depth because of the striking significance of one or two of the facets to relapse (Witkiewitz et al., 2014).

Coping Behaviour and Alcohol Relapse

Coping, in the alcohol relapse literature, refers to the cognitive and behavioural component that one employs to safeguard from the strains of life which has the potential to lead to alcohol use or abuse eventually contributing to relapse (Pearlin & Schooler, 1978; Shiffman, 1982; Kataria & Desai, 2019). Alcohol, for the most part, has always been a coping method that either contributes to the onset of drinking or acts as an impediment to abstinence which entails most relapse prevention programmes to include teaching healthier coping strategies when working with patients with alcohol use disorder (Mackinnon et al., 2017). Notably, none of the coping methods involved utilization of health services and this highlights the need for understanding as well as providing intervention from a culture-specific framework when it comes to countries like India and other low and middle income

countries (Koss-Chioino & Vargas, 1999; Griner & Smith, 2006; Nadkarni et al., 2013). In a pilot study among sixty patients with alcohol dependence syndrome which addressed coping and perceived expressed emotions at an institutional setting at NIMHANS, Bengaluru, India, the authors found that the lesser the age at first intake of alcohol, the better were their coping responses. These authors clearly expressed that the predictor variables could behave differently if the data were to be collected in a community setting because the study setting is an institutional one that provides a standard care plan for those admitted, which might not be available for those in the community thus influencing the findings. Therefore, further exploration in the community setting too is warranted to generalise this result (Reddy & Jagannathan, 2017). Apart from this, it is observed that self-efficacy and social support are another set of important factors influencing coping responses of the individual especially in the process of recovery in alcohol dependent individuals argued Osmany et al. (2014). This warrants further exploration by studying these variables together in the light of poor outcomes in relapse related intervention plans despite enormous data on coping.

Social Support and Alcohol Relapse

Social support is a factor that spans beyond the treatment settings playing a huge role in alcohol relapse or remission which has been extensively studied in the western countries (Kelly et al., 2010; Mowbray et al., 2014; Mericle, 2014; Stevens et al., 2014) but relatively lesser studied in the Indian context (Dixit, 2015).

Surveys assessing motivation to modify an individual's alcohol use, coping and social support on Caucasian adolescent males taking residential treatment for substance use disorders revealed solidification of social integration essentially could aid in avoiding the drug use (Wei et al., 2011) while social disintegration promotes heavy drinking (Hanson, 1994). Perceived social support satisfaction and several people available for social support predicted relapse in cocaine abusers who were taken from residential therapeutic treatment

settings belonging to different ethnic groups such as African American, Caucasian and Hispanic (McMahon, 2001). However, in terms of maintaining abstinence, some studies show rather a contrary result as evidenced by the research carried out in two alcoholic anonymous centres in Mumbai with individuals having a history of alcohol dependence syndrome that concluded “alcohol abstinence is not affected by adequacy of social support” (Saxena & Mital, 2011).

Anxiety and Depression in Alcohol Relapse

Psychiatric co-morbidities in alcohol use disorders including relapse cases are a common presentation (Montoya et al., 1995; Agrawal et al., 2009). Among the psychiatric illnesses (which is about 49%), mood disorders (e.g., anxiety and depression) are the most prevalent ones (Chaudhury et al., 2006; Bharati et al., 2017) accounting for about 21% (Gedam et al., 2019). Indian epidemiological data related to substance, mainly alcohol and other associated concerns show a strong frequency of anxiety-based disorders in persons with substance abuse disorders (Grant & Dawson, 2006). Anxiety has been mostly reported by individuals who are in the process of remission which may trigger a relapse (Friedmann et al., 1998) while depression has been linked with those in the process of relapse (Kishore et al., 2015).

Among 61 inmates of a rehabilitation centre in Kolkata, Shaikh and Ghosh (2011) examined general social support and specific social support along with abstinence self-efficacy on depression levels of substance users. Findings highlighted that social support and abstinence self-efficacy significantly affected the levels of depression hinting at the possibility of a dynamic interaction among those variables. Although many studies highlight the role of anxiety and depression in the alcohol relapse process or in the maintenance of remission, several studies (Tiffany & Conklin, 2000; Shaikh & Ghosh, 2011; Kelley et al., 2017; Beniwal et al., 2018; Ribadier & Varescon, 2019) indicate the need for addressing this

emotional problem associated with alcohol relapse from a perspective that includes other key risk factors (abstinence self-efficacy, social support, gender, personality factors, cognitive processes, craving) as well due to its direct or indirect effects on anxiety and depression.

Rationale for the Present Study

Most studies on the above variables are cross-sectional and provide inconsistent findings. Studies lack inclusion of many other key factors of relapse and remission while studying one of the variables ignoring the dynamic aspect of the interaction of the other variables in the alcohol relapse/remission process. For some of the variables like alcohol outcome expectancy and social support, there are fewer studies that have included separate aspects of those constructs such as for alcohol outcome expectancy there is positive alcohol outcome expectancy and negative alcohol outcome expectancy. For the variable, social support, there is social support number and social support satisfaction. Hence, these are not comprehensively studied in interaction with other key variables in the field of alcohol relapse/remission. Most of the research adopts simple linear models failing to provide a perspective that throws light on the possibility of the dynamic nature of the constructs. Not many studies have considered comparing whether treatment settings influence relapse or remission over time. Although poor outcomes in single approach intervention plans for patients with alcohol relapse are noted, many studies in India have not taken a multimodal treatment approach hinting at the lacunae for exploratory studies warranting such a multi-faceted approach. The scarcity of research based on an integrated theory that conceptualises interaction of several key factors in an Indian context where an evident regional variation exists is also glaring.

Therefore, the present study aims to identify the factors associated with remission and relapse in patients treated for alcohol dependence syndrome in residential and non-residential rehabilitation groups using a theoretical background of re-visited model of prevention of

relapse (also called the revised cognitive-behavioural model of relapse) of Witkiewitz and Marlatt (2004) to integrate the essential factors therein which comprises the distal factors (e.g., family history and social support) and the proximal factors also known as contextual factors (e.g., alcohol outcome expectancy, alcohol abstinence self-efficacy, individual's coping behaviours, negative emotional states- depression and anxiety, and level of mindfulness) by adopting a longitudinal research design.

Method

Aim

To identify the distal and proximal factors associated with remission and relapse in patients treated for alcohol dependence syndrome in residential and non-residential rehabilitation groups over time.

Objectives

1. To study the distal factors such as:
    a. the family history of alcohol abuse associated with remission and relapse in residential and non-residential rehabilitation groups.
    b. the social support associated with remission and relapse in residential and non-residential rehabilitation groups over time.
2. To study the proximal factors such as:
    a. the level of alcohol abstinence self-efficacy associated with remission and relapse in residential and non-residential rehabilitation groups over time.
    b. the level of alcohol positive and negative outcome expectancy associated with remission and relapse in residential and non-residential rehabilitation groups over time.
    c. the level of mindfulness associated with remission and relapse in residential and non-residential rehabilitation groups over time.

d. the coping behaviour associated with remission and relapse in residential and non-residential rehabilitation groups over time.
e. the level of anxiety associated with remission and relapse in residential and non-residential rehabilitation groups over time.
f. the level of depression associated with remission and relapse in residential and non-residential rehabilitation groups over time.

3. To understand the predictors of remission and relapse in residential and non-residential rehabilitation groups over time.

Hypotheses

H_{01} Remission and relapse and family history of substance abuse are not associated among the residential and non-residential rehabilitation groups over time.

H_{02} There is no significant difference in the number of people providing social support associated with remission and relapse among the residential and non-residential rehabilitation groups over time.

H_{03} There is no significant difference in the level of social support satisfaction associated with remission and relapse among the residential and non-residential rehabilitation groups over time.

H_{04} There is no significant difference in the level of abstinence self-efficacy associated with remission and relapse among the residential and non-residential rehabilitation groups over time.

H_{05} There is no significant difference in the level of alcohol positive and negative outcome expectancy associated with remission and relapse among the residential and the non-residential rehabilitation groups over time.

H_{06} There is no significant difference in the level of mindfulness associated with remission and relapse among the residential and non-residential rehabilitation groups over time.

H_{07} There is no significant difference in the coping behaviour associated with remission and relapse among the residential and non-residential rehabilitation groups over time.

H_{08} There is no significant difference in the level of anxiety associated with remission and relapse among the residential and non-residential rehabilitation groups over time.

H_{09} There is no significant difference in the level of depression associated with remission and relapse among the residential and non-residential rehabilitation groups over time.

H_{10} The clinically relevant risk factors as proposed in the reformulated relapse prevention model such as the family history of substance abuse, social support, alcohol abstinence self-efficacy, alcohol outcome expectancy, mindfulness, anxiety and depression do not significantly predict remission or relapse among the residential and the non-residential rehabilitation groups over time.

Operational Definition

Patients Treated for Alcohol Dependence Syndrome

Those who had already received a diagnosis of alcohol dependence syndrome by either a clinical psychologist or a psychiatrist and had been either admitted in the treatment facility (hospital or a rehabilitation centre) or treated on an out-patient basis for the same.

Relapse

In the present study, relapse cases are identified as those who previously took treatment for alcohol dependence syndrome and were discharged following which they again resumed drinking that required admission into the treatment facility.

Dynamic Nature of Relapse

The dynamic nature of relapse is viewed as a complex, nonlinear process in which both tonic (stable) (e.g., genetic or family history, social support, etc.) and phasic (transient) (e.g., abstinence self-efficacy, mindfulness, etc.) processes act jointly and interactively to influence the timing and severity of drinking behaviour or relapse (Hufford et al., 2003).

Baseline Assessment (period)

In this study, baseline assessment (period) is considered as the period during a patient's admission into the treatment facility following a relapse of alcohol use and when the data collection was carried out for the first time.

Follow-up Assessment (period)

In this study, this period refers to the two months (plus 1 or 2 weeks) from the day on which the baseline assessment was carried out.

Variables

Independent Variables

- Non-residential relapse group (NRG)
- Non-residential non-relapse group (NNG)
- Residential non-relapse group (RNG)

Dependent Variables

- Family history of substance abuse
- Social support
- Abstinence self-efficacy
- Alcohol outcome expectancy
- Mindfulness
- Coping
- Anxiety

- Depression

Research Design

The study has adopted a longitudinal design.

Sample

After determining the purpose of the study, research design and method of collecting the data, a purposive sampling method was adopted to select the sample. The sample consisted of 207 male participants treated for alcohol dependence syndrome in which 107 of them were those who were discharged after their treatment (referred in this study as the non-residential group) who were from Dr A.V. Baliga Memorial Hospital, Udupi and Link De-addiction Centre, Mangalore and the other 100 participants were those who were in the rehabilitation centre itself as part of their de-addiction programme, at Kripa Foundation, Mangalore, until two months following baseline assessment (referred in this study as the residential group). This latter group was selected as a comparison group for the two groups that would naturally emerge from the non-residential group such as the non-residential relapse group and the non-residential non-relapse group over time (especially during the follow-up assessment period).

Inclusion Criteria

- Males between the age group of 21-60 years of age.
- Those who were diagnosed as having alcohol dependence syndrome as per ICD-10 DCR criteria when they received treatment for their condition by a mental health professional in the rehabilitation centre.

Exclusion Criteria

- Diagnosed with co-morbid personality disorders, major physical illnesses, organic brain syndrome or mental retardation.
- Individuals in whom substance use was secondary to any other mental illness.

- Patients who sought treatment for the first time.

Tools and Technique

The following were the tools used to obtain the data. All these tools were translated to the Kannada language and then back-translated to the English language by experts and the validity of the translated version was established.

Sl. No	Tool	Author	Year
1.	Socio-demographic Data Sheet	Developed by the researcher	2015
2.	Social Support Questionnaire (Short Form)	Sarason et al.	1983
3.	Alcohol Abstinence Self-Efficacy Scale	DiClemente et al.	1994
4.	Alcohol Outcome Expectancy Scale	Leigh & Stacy	1993
5.	Five Facets of Mindfulness Questionnaire	Baer et al.	2006
6.	The Coping Behaviour Inventory	Litman et al.	1983
7.	Beck Anxiety Inventory	Beck & Steer	1990
8.	Beck Depression Inventory-II	Beck et al.	1996

Procedure

Participants were selected from Dr. A. V. Baliga Memorial Hospital Udupi, Udupi district, Link De-addiction Centre and Kripa Foundation, Mangalore, Dakshina Kannada district. After explaining the purpose of the study and obtaining consent from the institution concerned and the respective participants, data collection was initiated. First, baseline

assessment measures for the non-residential and residential groups were collected. The questionnaires were administered either individually or in groups depending on the number of participants at that given time and also the space provided at the respective centres. Further, follow-up assessments were collected from the same participants after 2 months for both the groups.

After 2 months, the participants from the non-residential group were contacted over the phone and called to the rehabilitation centre for collecting the follow-up data, who either came as part of their regular follow-up or solely for the research study. For some of the participants, the follow-up data was collected over the phone itself as those participants cited practical constraints (such as long-distance travel, psychiatrist's availability for follow-up and medication purposes in their respective village/town/city camps that the hospital organizes once a month and being occupied with other priorities) as reasons for not being able to visit the rehabilitation centre. During follow-up assessment, the data collection most often took place individually for the participants from the non-residential group. For those from the residential group, the questionnaires were most often administered in groups on the premises of the centre itself. The duration of the data collection was from March 2017 to March 2019 (2 years).

Pilot Study

A pilot study was conducted with ten participants to assess the feasibility of administering the assessment tools, to determine the adequacy of the data obtained and the efficiency of the chosen tools, to know the time required for each participant to answer the questionnaires and also to determine the availability of the sample. From the pilot study, it was established that the participants were able to read, comprehend and respond to all the items of the tools. It was observed that participants found the mindfulness questionnaire tiring to answer on their own due to its lengthy nature, however, when it was read out and

explained, they could answer them appropriately and quickly. Hence, the pilot study gave a fair understanding of the feasibility of the tools and the time required to administer them to each participant. It was also noted that one or two reminders before a week or so were required to remind the participants to come for follow-up assessment which was after two months after their discharge post-treatment.

The process of data collection was split into two phases.

Phase 1: Baseline Assessment

In the first phase of the process of data collection, baseline data were collected from participants who were admitted into the rehabilitation centre or the hospital due to relapse (non-residential group) and the data was also collected from the other group where participants stayed there for two months as part of their de-addiction or rehabilitation program (residential group). Rapport was established with them and the socio-demographic details were obtained following which standardized tools were administered in ascending order concerning the number of items: Social Support Questionnaire- Short form (12 items), Alcohol Abstinence Self-Efficacy Scale (20 items), Beck Anxiety Inventory (21 items), Beck Depression Inventory (21 items), Alcohol Outcome Expectancy Scale (34 items), The Coping Behaviour Inventory (36 items) and Five Facets of Mindfulness Questionnaire (39 items). The sequence of administration was uniform for all participants. All the tools were administered in one sitting and it took around 30-45 minutes to answer them all. The obtained raw data was organized, structured, scored and interpreted to transform it from data to information.

Phase 2: Follow-up Assessment

In the second phase of the process of data collection, follow-up data were collected from participants who were discharged from the rehabilitation centre or the hospital after treatment (non-residential group) and also from the other group (residential group) who

were in the rehabilitation centre itself for two months (following baseline assessment). Participants from the non-residential group emerged into two distinct groups in which some relapsed and a few others did not relapse. Hence this non-residential group was divided into the non-residential relapse group (NRG) and the non-residential non-relapse group (NNG). Participants from the residential group did not have any opportunity to relapse as they stayed in the same rehabilitation centre during the follow-up assessment period. Hence, they were called the residential non-relapse group (RNG). The same procedure as followed in phase 1 was repeated uniformly across participants from all three groups (NRG, NNG and RNG). Finally, the obtained raw data was organized, structured, scored and interpreted to transform it from data to information.

Ethical Consideration

1. The present study was approved by the doctoral committee of the University of Mangalore.
2. The researcher had explained the purpose of the study to the medical director of the hospital (Dr. A. V. Baliga Memorial Hospital) at Udupi and also the heads of the NGOs namely Link De-addiction Centre, Mangalore and Kripa Foundation, Mangalore and obtained written consent.
3. Written informed consent was obtained from each participant.
4. The participants were clearly instructed about their ‘right to decline or withdraw participation at any point of time during the study.
5. The participants were assured of confidentiality and also that the obtained data would be used for research only.

Analysis of Data

1. Descriptive statistics were used to describe the socio-demographic characteristics.

2. Chi-square test of association was used to find out the association between family history of substance abuse among non-residential and residential groups.
3. Repeated measures ANOVA was used to compare the means of all the dependent variables having more than one observation (i.e., same measure observed at two time-points) including one or more independent variables (non-residential relapse group, non-residential non-relapse group and the residential non-relapse group).
4. Multivariable multinomial logistic regression was used to find out the predictors of alcohol relapse and remission over time.

Summary and Conclusion

Major Findings of the study

Findings from the demographic characteristics

- Majority of the participants who have a positive family history of alcohol or substance use disorders are found in the non-residential relapse group as compared to the other two groups. There is a greater number of individuals without a positive family history among the non-residential non-relapse group and residential non-relapse group when compared to those in the non-residential relapse group.

Findings from hypotheses testing

- Family history of alcohol abuse does not affect remission and relapse of alcohol abuse irrespective of their membership among the residential or the non-residential rehabilitation settings.
- Those who are let out in the community after treatment and relapse report having a lesser number of people providing them with social support as compared to the participants in the residential centre who are sober.
- It is found that social support satisfaction increases with time. Those who are let out in the community and relapse as well as those who do not relapse have significantly

higher levels of social support satisfaction when compared to those who are in the residential rehabilitation centre and stay sober.

- Higher abstinence self-efficacy is found in those who are in remission whereas lower abstinence self-efficacy is found in those who relapse.
- Looking at the sub-scales of alcohol abstinence self-efficacy we find that:
    - When experiencing negative affect, the confidence to not drink alcohol increases with time among both, those who relapse as well as those who stay sober and more so in those who stay sober irrespective of whether they are from the residential or non-residential treatment setting.
    - When there is a social situation and having a good time, the confidence to not drink alcohol increases with time among both, those who relapse as well as those who stay sober and more so in those who stay sober irrespective of whether they are from the residential or non-residential treatment setting.
    - When experiencing physical symptoms, the confidence to not drink alcohol increases with time among both, those who relapse as well as those who stay sober and more so in those who stay sober irrespective of whether they are from the residential or non-residential treatment setting.
    - When experiencing craving and urges, the confidence to not drink alcohol increases with time among both, those who relapse as well as those who stay sober and more so in those who stay sober (either by being in the residential or non-residential treatment setting).
- With time, positive alcohol outcome expectancy is found to be significantly lower in those who remain sober as compared to the participants who relapse.
- Participant's alcohol negative outcome expectancy is higher among those who relapse as compared to those who remain in remission.

- The level of mindfulness is found to be higher for participants who are in the community and relapse as compared to those who stay in the rehabilitation centre itself and do not have a chance to relapse.
- The sub-domains of mindfulness reveal that:
    - The ‘observing’ component of mindfulness, i.e., paying attention to the internal thoughts, feelings and the stimulation from the environment which can be used to learn to disengage from the bothering thoughts and feelings and let them go with practice is higher for those who are in the community post-treatment and relapse. Whereas, it is lower for those who did not relapse while being in the residential treatment setting and such a difference is found to occur over time.
    - The ‘describe’ aspect i.e., the ability to label one’s experiences or thoughts as well as emotions using the right words is usually beneficial in understanding what kind of thinking goes on in the mind to change them later from the habitual patterns is higher for those who are in the community post-treatment and relapse. While it is considerably lower for those who do not relapse either while being in the community or the residential treatment setting.
    - The ability to direct one’s attention to the present moment task without paying attention to those of the past or the future (ability to act with awareness) is not a significant aspect of mindfulness when considering those who relapse or stay sober either while being in the residential or non-residential treatment setting.
    - With time, for those who are in the community post-treatment and relapse, being non-judgmental to one’s internal thoughts and feelings (for example, not considering oneself as ‘bad’ because he/she did not live up to the expectations

of the significant other) is marginally lower than for those who do not relapse either while being in the community or the residential treatment setting.

    - Those who are in the community post-treatment and relapse do not bother about the thoughts of inner experiences and emotions, for example, worthlessness/helplessness/hopelessness and anxiety or depression respectively leading to withdrawal from day-to-day functioning as compared to those who do not relapse while being in the residential treatment setting and that such a difference is found to occ/ur over time.

- With time, coping behaviours change or improve. Additionally, over time, coping behaviours are found to be used more frequently by those who do not relapse as compared to those who relapse while being in the community and also among those who stay sober while being in the residential setting.
- In the sub-scales of the coping behaviours inventory, we see that:
    - With time, using a positive thinking strategy (for example, “life is no bed of roses but drink is not the answer”) to cope generally improves. It is found that those who relapse while being in the community post-treatment used this strategy more frequently than those who do not relapse while being in the residential treatment setting and that such a difference is found to occur only over time.
    - With time, coping using negative thinking (for example, “how I’ve let my family down in the past”) generally improves. There is no significant difference in the frequency of coping using negative thinking for either those who relapse or stay sober while being in the residential or the non-residential treatment setting.

    - With time, coping using avoidance or distraction (for example, “avoiding places where alcohol is available” or “going for a walk or to work”) generally improves. For those who are in the community post-treatment and relapse, coping using avoidance or distraction is less frequently used as compared to those who do not relapse either while being in the non-residential or the residential treatment setting and such a difference is found to occur over time.
    - There is no significant difference in seeking social support (such as “telephoning a friend” or “going to A. A. meetings or to friends who don’t drink”) as a way of coping among those who relapse or stay sober either while being in the community or the residential treatment setting.
- Although the level of anxiety is found to decrease with time, it is significantly high for those who relapse as compared to those who do not relapse.
- The level of depression is found to decrease over time and it is higher for those who relapse as compared to those who do not relapse.
- Socio-demographic variables such as age, education status and positive family history of substance use disorder do not predict either relapse or remission.
- It is found that larger amounts of increase in alcohol abstinence self-efficacy are necessary to reduce the risk of relapse for an individual who is let out in the community after treatment as compared to an individual who is retained in a residential rehabilitation setting.
- When there are a large number of people providing social support, it facilitates a reduced risk of relapse for an individual who is let out in the community after treatment as compared to an individual who is retained in a residential rehabilitation setting.

- When there is an increased level of social support satisfaction for those who are let out in the community after treatment, they are more likely to relapse when compared to those who are retained in a residential rehabilitation setting.
- Larger amounts of increase in anxiety levels entails the risk of relapse when an individual is in the community after treatment as compared to an individual who is retained in a residential rehabilitation setting.
- Larger amounts of increase in depressive symptoms does not necessarily mean that an individual will entail the risk of relapse.
- For an individual to be in a state of remission, they would have to have a sharp reduction in alcohol positive outcome expectancy while being in a non-residential rehabilitation setting.
- Negative outcome expectancy is an important contributory factor for remission than relapse. A good quantum of increase in negative outcome expectancy is necessary for those in the community for maintaining abstinence.

Implications of the Study

- The results signify that the key risk factors of reformulated relapse prevention model do influence relapse and remission over time but with some exceptions and hence can be addressed in the intervention plans for patients with alcohol dependence syndrome.
- The findings of this study provide credence to some of the theoretical constructs of non-linear dynamical systems theory while considering the results of positive family history of substance use disorder.
- The way a lot of proximal factors influence drinking behaviour consists of nuances such as some factors improve only with time in a particular group of participants (those who relapse or those who stay sober) while among some factors it is difficult to ascertain improvements especially if the individuals are placed in a particular

treatment setting. Therefore, it is important to account for these nuances while employing treatment strategies targeting the relapse of alcohol.

- Rehabilitation centres can adopt a holistic approach in their management of patients admitted for relapse prevention emphasising the role of social support satisfaction, alcohol outcome expectancy and levels of anxiety and depression in combination.
- The study highlights the need for careful consideration of the concept of mindfulness in intervention programmes for alcohol dependence syndrome. A commonly held attitude that those who have lesser mindfulness may relapse must be refined to include the finer aspects of which component of mindfulness is higher or lower. Thereafter, decisions on using mindfulness strategies should be taken.
- The findings of the study can be used to understand the importance of social support which often seems to be neglected in the rehabilitation centres or the treatment plan while emphasising more on the individual treatment plans.
- The findings of the study can be used to plan treatment modules specific to each risk factor thereby enhancing targeted outcomes depending on each patient's clinical profile.
- Finally, the findings can also be used to draft policies for the welfare of patients with alcohol dependence syndrome and their family members.

Assumptions

- It is assumed that the participants have responded to the standardised questionnaires or inventory by understanding either the statements or the questions clearly in their true sense.
- It is assumed that all participants have answered the standardised questionnaires or inventory honestly and candidly.

Limitations of the Study

- Multiple time points could not be studied due to practical constraints of the patients as well as the researcher.
- Including only male patients with alcohol dependence syndrome.
- Co-morbid disorders or any other drug use commonly found in patients with alcohol dependence syndrome were not studied.
- Drinking behaviour and intensity could also have been studied to understand the pattern of lapses to support the quality of the dynamic nature of the outcome variables.

Scope for Further Study

- A semi-structured interview for alcohol negative outcome expectancy, social support satisfaction and mindfulness could be taken up to understand more specific and individualistic reasons that could play a role in relapse and remission of alcohol.
- Future studies can observe the key risk factors at shorter time intervals as well as at multiple time points for a year or two.
- Mediation analysis of certain other variables that are related to relapse of alcohol such as stressful life events, personality traits and treatment-related variables other than the key risk factors could be taken into consideration for future research.
- Increased sample size with equal numbers and random selection of the groups could be considered for extending the findings of this study.
- Comparison of key risk factors for remission and relapse between places where there is the ease of availability of alcohol and places where there is difficulty in easily procuring alcohol could further strengthen the existing theories of alcohol relapse.

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